

**Closure Plan for Building 123
Components of
RCRA Unit 40**

**U. S. Department of Energy
Rocky Flats Environmental Technology Site**

August 1997

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ADMIN RECORD

**CLOSURE PLAN FOR BUILDING 123
COMPONENTS OF RCRA UNIT 40**

REVISION 0

AUGUST 1997

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1.0 INTRODUCTION

Partial closure of RCRA Unit 40 includes the closure of the RCRA regulated process waste lines, sumps, and pumping stations associated with Building 123 at the Rocky Flats Environmental Technology Site (RFETS). This system includes process waste lines currently used in the building, as well as one active underground line. The Building 123 area encompasses overlapping Individual Hazardous Substance Sites (IHSSs) 121 and 148. IHSS 121 includes the underground Original Process Waste Lines (OPWLs) P-1, P-2, and P-3. Leakage from old process waste lines and possible spills from operations may have resulted in contaminated soil beneath and adjacent to Building 123. This potentially contaminated soil has been designated IHSS 148. The OPWL is a network of tank and underground pipelines constructed to transport and temporarily store process waste from point of origin to on-site treatment and discharge points. Both the active and inactive systems include underground lines which transfer the process waste to valve vaults or holding tanks. All process waste lines inside the building are currently active. Closure will include deactivation, dismantlement, and remediation of all above ground pipelines, sumps, and pumping stations in Building 123, and the active underground pipelines that leave the building and extend to Valve Vault 18.

This project will remove Buildings 123, 123S, 113, and 114 at RFETS will eliminate Individual Hazardous Substance Site 148 and will close a portion of RCRA Unit 40. The Building 123 slab and foundation will be removed as required to remediate contamination beneath the building as dictated by soil sampling results. The overall project is being conducted as an accelerated action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) approved under the 123 PAM. The Interim status plan has not been issued, however this closure plan is consistent with and reflects the provisions of Part X of the sitewide RCRA permit. RCRA Unit 40 currently has Interim status, and as a result, the partial closure activities fall under Colorado Hazardous Waste Regulations: Part 265, Subpart G -Closure and Post Closure.

The Proposed Action Memorandum (PAM) is a decision document for the D&D of Building 123 and has been submitted to the Department of Energy (DOE) and the Colorado Department of Public Health and Environment (CDPHE) for approval. The 123 PAM references this unit closure plan. Partial closure of RCRA Unit 40 is part of a larger project to decontaminate and decommission (D&D) Building 123 and surrounding area.

2.0 FACILITY CONTACT

The RFETS contact for closure activities is:

Manager, Rocky Flats Field Office
U. S. Department of Energy
P. O. Box 928
Golden, Colorado 80402-0928

Phone: (303) 966-2025

3.0 UNIT CLOSURE NOTIFICATION, CERTIFICATION AND SCHEDULE

The closure of the building process waste system, sumps, and underground pipelines will be conducted as a partial closure of Unit 40. Notification to the Director of the intent to close the process waste system will be submitted to the Colorado Department of Public Health and Environment (CDPHE) 45 days prior to the planned start of closure activities.

If the total time necessary for closure will exceed 180 days, the facility will notify the Director within 30 days of knowing that closure will take longer than 180 days (Part 265.113(b)) and at least 30 days prior to the expiration of the 180 day closure period (Part 265.113(c)).

Within 60 days after completion of closure activities, the facility will notify CDPHE through submittal of proper certification that the unit has been closed in accordance with the approved closure plan. The certification package will be signed by the owner or operator and by an independent, Colorado-registered professional engineer.

4.0 REGULATORY REQUIREMENTS

A plan for closure of RCRA hazardous waste treatment and storage units at RFETS is required pursuant to 6 CCR 1007-3, Part 265 of the Colorado Hazardous Waste Regulations: Part 265, Subpart G - Closure and Post Closure, Sections 265.110 through 265.120.

No demonstration of financial responsibility is required because compliance with 6 CCR 1007-3, Part 266, Subpart A - Financial Requirements, is not required for government owned facilities.

5.0 UNIT DESCRIPTION

RCRA Unit 40

RCRA Unit 40 is the site-wide network of tanks, pipelines, and sumps constructed to transport and temporarily store process waste from point of origin to on-site treatment and discharge points. Sections of Unit 40 covered by this plan include all process waste lines, sumps, and tanks in Building 123, and one active underground line. Three other underground lines designated as P-1, P-2, and P-3 exist under Building 123. A diagram of the building and the associated underground process waste lines are shown in Figure 1-1. The lines transferred the following process waste from Building 123:

Acids:	nitric acid, hydrofluoric acid, sulfuric acid, hydrochloric acid, acetic acid, formic acid, oxalic acid, and perchloric acid;
Bases:	ammonium hydroxide and sodium hydroxide;
Radionuclides:	various isotopes of plutonium, americium, uranium, and curium;
Metals:	Calcium, Magnesium, and Iron effluents, beryllium (trace amounts); and
Others:	ammonium nitrate, ammonium thiocyanate, ammonium chloride, ammonium oxalate, ammonium hydroxylamine, ethylene glycol, DDCP, DTPA, potassium permanganate, sodium nitrate, sodium carbonate and toluene.

The tanks, pipelines, and sumps incorporated into RCRA Unit 40 include the process waste lines, sumps and pumping stations in Rooms 103A, 103, 105, 111, 112, 113B, 123A, 123, 124, 125, 126, 126C, 127, 155, 155B, 156, 157, and 158 in the building, and the active underground line that connects to Valve Vault 18. The underground line is shown in Figure 1-1 as the "Active Process Waste Line".

In 1989, the process waste transfer system was upgraded, including the removal of an east-west section of P-1 between MH-2 and MH-3. The north-south section of P-1 between Building 123 and MH-1 was converted to the new process system. Three large, interconnected concrete sump pit areas were installed in Rooms 156, 157, and 158. Piping was installed connecting MH-1 to Valve Vault 18. A drawing of Building 123 can be found in Appendix A. The drawing shows the locations of overhead and underground lines.

The active pipeline shown in Figure 1-1 which runs from the building to Valve Vault 18 was the active part of RCRA Unit 40 associated with Building 123. Part of P-1 was used in the new system. Soil around all of the underground pipelines, including P-1, will be sampled as part of the Building 123 D&D activities. The pipelines, P-2 and P-3, under Building 123 were abandoned in 1982. Building Operations prior to 1985 were not regulated under RCRA, and, therefore, P-2 and P-3 are not part of RCRA Unit 40. As such they are not included with this closure plan. These lines will be investigated and treated in the same manner as the underground line that is part of RCRA Unit 40. Building 123 PAM addresses the investigation and potential remediation of P-2 and P-3.

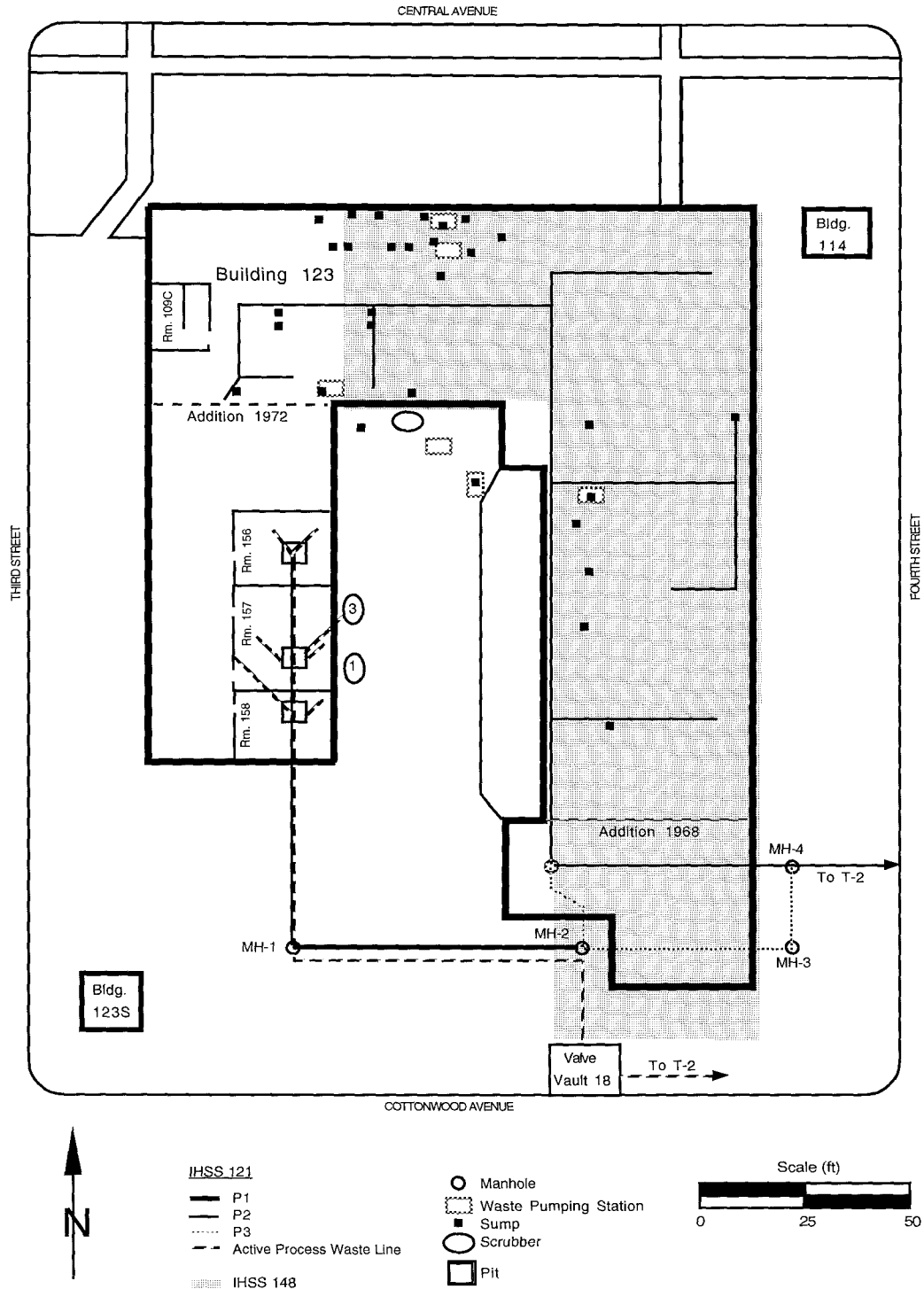


Figure 1-1 Location Of Building 123 And Associated IHSSs 121 And 148

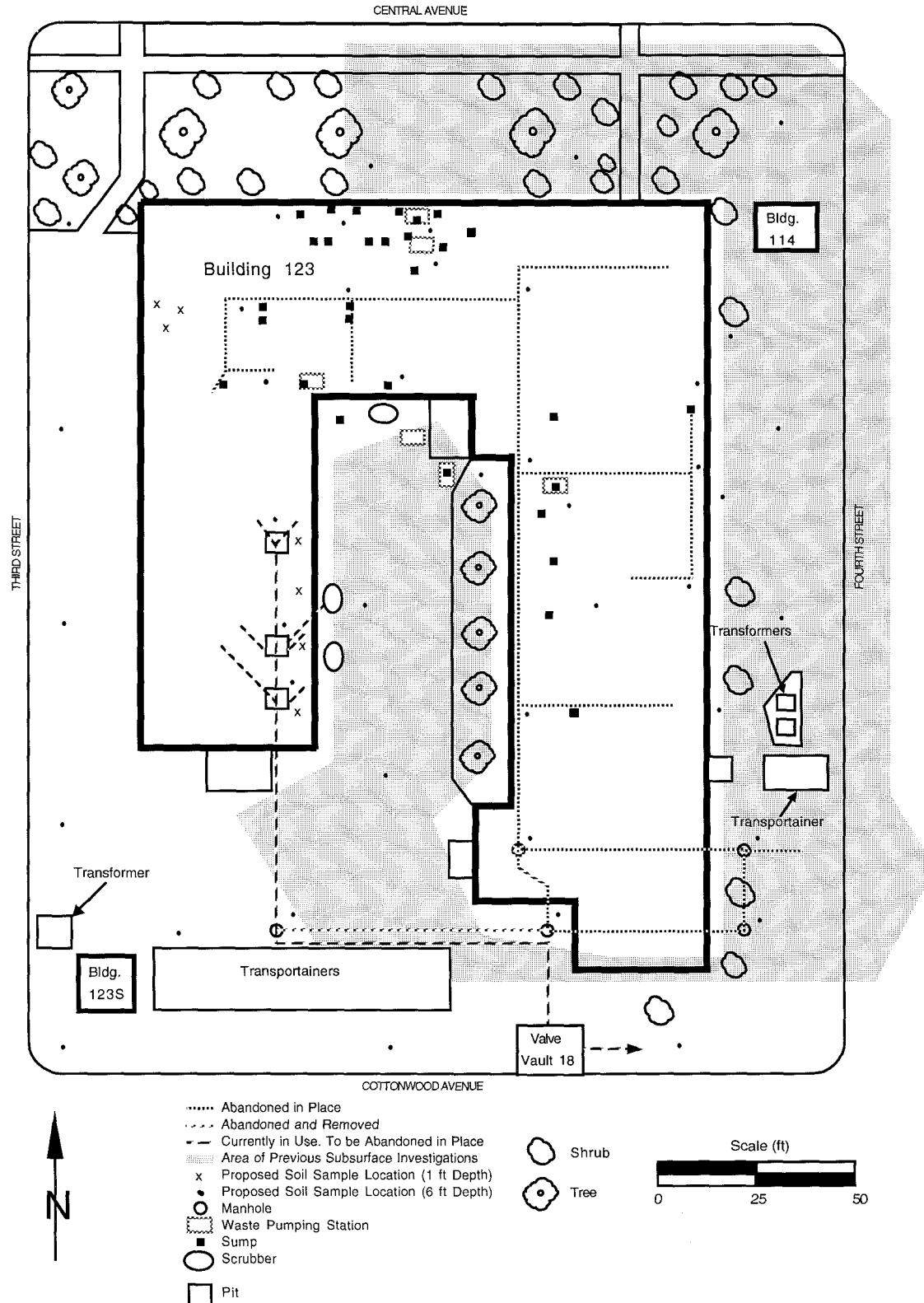


Figure 1-2 Soil Samples For Partial Closure Of RCRA Unit 40

6.0 CHARACTERIZATION

6.1 PROCESS WASTE LINE CHARACTERIZATION

Characterization of the process waste line is primarily based upon process knowledge, and existing documentation which indicates that no hazardous waste has been disposed of in the process waste system. As a final check, the RCRA Unit 40 systems will be flushed with rinse water, and the final rinsate will be sampled for radionuclides. The pH will also be measured.

6.2 SOIL CHARACTERIZATION

A complete characterization of the soil in the Building 123 area will be done as part of the aforementioned Proposed Action Memorandum. Soil characterization will include sampling and analysis of the soil beneath and surrounding Building 123. Following removal of the building superstructure, samples will be collected through the slab to determine the necessity for soil remediation. A sampling and analysis plan (SAP) has been written to guide characterization activities in these areas. The SAP incorporates a review of existing records to establish the location of potentially contaminated areas and to define sampling protocol. Prior to sampling, the sample locations, depth and frequency will include recommendations from the RFETS Statistical Applications Group. Current planning indicates a need for approximately fifty (50) soil samples beneath the slab of Building 123 and from areas surrounding underground, abandoned OPWLs. Figure 1-2 shows the sampling locations. Samples will be collected at depths immediately below the pipe to locate any contamination that may have leaked from the lines. Samples will be analyzed for Volatile Organic Compounds (VOCs), Target Analyte List (TAL) Metals, radionuclides, and nitrates. Data quality requirements supporting the analysis effort will conform to criteria established in "Guidance for the Data Quality Objective Process", EPA QA/G-4 (EPA 1994). The Data Quality Objectives are listed in the Soil Sampling Analysis Plan to characterize IHSS 127 and 148 in Building 123. (See RF/RMRS-97-023)

7.0 CLOSURE PERFORMANCE STANDARD

The closure performance standard specifies that hazardous waste facilities are to be closed in such a way as to (1) minimize the need for further maintenance at the facility, and (2) protect human health and the environment by controlling, minimizing, or eliminating potential releases of hazardous waste to the environment (6 CCR 1007-3, Section 265.111).

Additional sampling of the soil surrounding the underground piping will be done as detailed in Section 6.0. The contaminants of concern are heavy metals or volatile organics that may have been present in underground lines prior to 1985. Provided that all soil sampling is below RCRA regulated levels and below the Tier 2 levels, as found in the RFCA, underground piping will be grouted and left in place. If hazardous constituents are found in the soil, the piping and soil will be removed as part of the Proposed Memorandum of Action for Building 123. If radioactivity is also present the soil and underground piping will be managed as mixed wastes. If radioactivity is not found, it will be managed as hazardous waste.

The building which houses this part of RCRA Unit 40 will be demolished. This will ensure compliance with the first standard. To comply with the second standard, the lines will be flushed with a volume of water equal to three times the volume of the system. Samples of the final rinsate will be analyzed for pH and radioactivity. The system will then be dismantled.

Based upon process knowledge, this pipeline must be handled as contaminated with low level radioactivity. Process knowledge, and results of the pH testing should confirm that they are non-hazardous. Whenever possible, the pipeline will be recycled through an off-site contractor. Pumps and other parts of the system will be disposed of as low level waste. If a site cannot be found to accept contaminated pipeline, they will be cut up and disposed of as low level waste. Should the testing prove that the pipeline is also hazardous, the system components will be disposed of as mixed waste.

8.0 SPECIFIC CLOSURE ACTIVITIES

Closure activities will be performed to achieve the objectives of the closure performance standard. The activities will be conducted in conjunction with decontamination and decommissioning activities covered by the PAM for Building 123, which includes remediation of the remainder of the building and abandoned OPWLs under the building. Closure activities will be implemented to emphasize the protection of human health and the environment, as well as waste minimization.

The following sections outline the procedures necessary to close active process waste lines in Building 123; associated sumps and pumping stations; and active underground lines between Building 123 and Valve Vault 18.

8.1 PREPARATION OF ENGINEERING PACKAGES AND WORK PACKAGES

Engineering and work packages will be used to govern the deactivation and decommissioning activities. Engineering designs will be developed for removal and decommissioning activities. The engineering package will describe the sequence of activities and methods of size reducing, dismantling, and packaging of the building materials. The packages are being prepared for the Building 123 project in three phases:

- 1) Deactivation of the building,
- 2) Demolition of the building,
- 3) Remediation of underground contamination and/or closure of the underground pipeline as required.

The RCRA Unit 40 system located in the building as described in an earlier section will be covered by the Deactivation and Demolition packages. Remediation and stabilization will be accomplished by the remediation and closure package.

8.2 HEALTH AND SAFETY

The RFETS Health and Safety Practices Manual defines general health and safety measures to be followed at the Site. All closure activities will be conducted in accordance with the manual. In addition, a specific Health and Safety Plan has been written for Building 123 D&D activities, which specifically addresses D&D and RCRA Unit 40 closure activities. As Low As Reasonably Achievable (ALARA) principles will be followed regarding personnel radiation dosage and exposures to hazardous materials. Radiation Control Technicians will survey all rooms in the building for radiation, and the pipelines and sumps will be monitored for radiological contamination.

In accordance with Site procedure 1-74000-IWCP, September 4, 1996, Integrated Work Control Program (IWCP) work packages will be prepared to direct and control all work. The packages will be organized similarly to the engineering packages. Each work package will contain a Job Safety Analysis (JSA), which addresses all health and safety issues in detail.

8.3 TANK SYSTEM CLOSURE ACTIVITIES

Final characterization of the soil under Building 123 cannot be determined until the building has been removed. Closure activities of the above ground RCRA Unit 40 tanks and pipelines (in the building) will begin as soon as the building is evacuated, and advance notification has been made to CDPHE. Closure of the underground lines is dependent upon the amount of contamination discovered in the final characterization.

8.3.1 Closure of Pipeline, Sumps, and Pumping Stations in the Building

The process waste system in the building has only been used as an elementary neutralization unit. The majority of the liquids that were discarded were acids and bases from the RCRA category D002. No listed waste was put in the system. Closure of the system will be done as follows.

The system will be flushed with water a minimum of three times the volume of the system to remove any remaining trace amounts of acid or base. The rinsate will be measured for pH and radiological constituents. The piping will be cut into sections and examined for sludge and scale. If this inspection determines that the pipes are clear, they will be recycled whenever possible. Sources will be sought to recycle the piping in a radiation environment. If this is not possible, they will be disposed as low-level waste.

8.3.2 Closure of Underground Pipelines from Building 123 to Valve Vault 18

The choice of closure activities for underground pipelines will be influenced by the extent of hazardous contamination, found in soil sampled near the pipeline. One or more sets of activities will be pursued, based upon the amount of RCRA regulated contaminants that are found:

- RFCA, Tier 2*
- 1) Contamination above RCRA levels,
 - 2) Contamination below RCRA levels and below Tier 2 levels, as found in RFCA,
 - 3) Contamination below RCRA levels and above Tier 2 levels, as found in RFCA.

Underground pipelines and the soil around the pipelines contaminated above RCRA levels will require thorough decontamination, including removal of contaminated soil and pipelines. Soil contaminated above RCRA regulated levels will be removed and managed as hazardous waste.

If sampling shows an extensive contamination plume in the soil, other management options such as soil vapor extraction, thermal drying, or on site stabilization may be pursued upon agreement with CDPHE personnel. If any these options are necessary, an addendum to this closure plan will be submitted.

If analytical results show soil to be free of hazardous contamination below RCRA and Tier 2 regulatory levels as found in the RFCA, the following actions will be taken. Underground pipelines will be filled with grout, capped and left in place. If post-closure care requirements apply, concerns will be described in an approved RFCA Decision Document.

8.4 ESTIMATE OF WASTE VOLUMES TO BE GENERATED

Table 1-1 describes the types and estimated quantities of waste to be generated. It also describes how the waste will be handled.

If sampling shows an extensive contamination plume in the soil, other management options such as soil vapor extraction, thermal drying, or on site stabilization may be pursued upon agreement with CDPHE personnel. If any these options are necessary, an addendum to this closure plan will be submitted.

If analytical results indicate that ~~pipelines and sumps~~ ^{soil} are free of hazardous contamination or contain hazardous contamination below ~~RCRA~~ and Tier 2 regulatory levels as found in the RFCA, the following actions will be taken. Underground pipelines will be filled with grout, capped and left in place. If post-closure care requirements apply, concerns will be described in an approved RFCA Decision Document.

If analytical results show ~~pipelines and sumps~~ ^{soil cont} to be below RCRA, but above the Tier 2 levels as found in the RFCA, the following actions will be taken. ~~Pipelines and sumps in the building will be flushed to remove residues, sectioned, and disposed of as waste. Residues from rinse water will be collected, characterized and treated at the appropriate Site treatment facility. Underground lines will be filled with grout, capped, and left in place. Soil will also be left undisturbed. As part of the RFCA Plant Closure, a risk assessment will be conducted. Results from these investigations will be thoroughly analyzed as part of the plant risk assessment. Remediation activities will then be conducted on the pipelines and soil according to the results of the risk assessment, with a CDPHE approved RFCA Decision Document.~~

8.4 Estimate of Waste Volumes to be Generated

Sections of the overhead waste system were removed and replaced during 1989. Neither radioactive nor hazardous contamination was detected in any of the removed sections. If sampling of the rinsate or examination of the pipeline reveals that the pipeline is contaminated with radiological or hazardous constituents, the waste will be handled as described in Table 1 below. Table 1 also describes the type and estimated quantities of waste.

① Subpart C 261 levels

~~RCRA 40CFR 261.21, 261.22~~

~~to evaluate
the need, if any
for further action.~~

Table 8-1 Estimated Volume of Waste to be Generated

Waste Type	Waste Forms	Disposition of Waste	Estimated Quantity
Industrial, Hazardous, Low Level or Low Level Mixed	Process waste pipelines Plastic, paper, from decontamination or LLW handling	Industrial waste will be packaged and shipped to the USA landfill in Erie, Colorado by the Demolition Subcontractor LLW or Hazardous is: - Handled by onsite trained workers - Prepared for low level packaging or DOT hazardous drums - LLW requires certification by K-H Waste Certification - Packaged by qualified RFETS technicians - Delivered to RMRS Waste Operations for storage prior to future offsite disposal	500 Cubic Ft.
Low Level Mixed	Soil from remediation underground pipelines plastic, paper, tools, etc. from remediation activities	- Handled by radiation trained workers - Prepared for Low Level Drums or boxes - Requires certification by K-H Waste Certification - Packaged by qualified RFETS technicians - Delivered to RMRS Waste Operations for storage prior to future offsite disposal	Up to 2100 Cubic Ft. (Waste will be generated only if contamination indicates need for remediation.)

9.0 DISPOSITION OF WASTE GENERATED DURING CLOSURE

Remediation and closure activities may generate a combination of radioactive, hazardous, and mixed wastes. Contaminated soil and pipeline material are expected to be the major sources of waste. Wastes consisting of plastic, tools, personal protective equipment and other materials associated with demolition and remediation will also be a major source of waste. Contaminated waste will be handled by qualified waste packaging technicians who will work with decontamination specialists and radiation control technicians to identify and segregate the Hazardous or Low Level waste. Analytical sample results and radiation survey results will be used to guide the waste management activities. Drums or boxes will be provided by the Waste Disposal group. Waste packaging technicians will package and label the waste, and will arrange for radioactive waste to be certified by the Kaiser-Hill Waste Certification group. The Project Waste Coordinator will work with the certification personnel and prepare all required documentation. Liquid hazardous or radioactive waste generated after the process waste lines are no longer in service will be collected in drums and shipped to Building 374 for processing. Solid waste in drums or boxes will be managed by the Waste Disposal group in an appropriate storage area prior to off site shipment.

10.0 RECORD KEEPING

The following closure documentation will be maintained:

- Date, number, and type of sampling activities
- Analytical results
- Records of actions taken to decontaminate equipment or structures
- Work control packages developed to govern closure activities
- Certification and other documentation that closure was conducted in accordance with the closure plan

Appendix A
First Floor Plan